

# ASP.NET FULL STACK DEVELOPMENT

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# 1-DATA BASE FUNDAMENTALS

## 1-Introduction To Database

- Data & Information
- File Based System.
- What is Database, Database System?
- DBMS & its functions.
- Database Properties.
- Advantages and Disadvantages of Database Systems.
- DB Architecture.
- Distributed Processing & Architectural Design.
- Who Deals with Database.
- Database Life Cycle
- Relational Database



# 1-DATA BASE FUNDAMENTALS

## 2-Entity Relationship Diagram

- Importance of ER Model
- Basic constructs of the E-R model
- Entity
- Entity categories
- Entity keys
- Primary Key
- Foreign Keys
- Candidate Key
- Composite Key
- Partial Key





# 1-DATA BASE FUNDAMENTALS

## 2-Entity Relationship Diagram

- Attribute
- Attribute categories
- Entity categories
- Simple (Scalars) Attribute
- Composite Attribute
- Derived Attribute
- Multi-valued Attribute
- Complex Attribute



# 1-DATA BASE FUNDAMENTALS

## 2-Entity Relationship Diagram

- Relationship
- Degree of Relationships
  - Recursive Relationship (Unary)
  - Binary Relationship
  - Ternary Relationship
- Cardinality Constraint
  - One-One Relationship
  - One-Many Relationship
  - Many-Many Relationship
- Mapping Cardinalities
- Participation Constraint
  - Optional
  - Mandatory





# 1-DATA BASE FUNDAMENTALS

## 3-ERD Mapping to Tables

Step 1: Mapping of Regular Entity Types

Step 2: Mapping of Weak Entity Types

Step 3: Mapping of Binary 1:1 Relation Types

Step 4: Mapping of Binary 1:N Relationship Types

Step 5: Mapping of Binary M:N Relationship Types

Step 6: Mapping of Multi-valued attributes

Step 7: Mapping of N-ary Relationship Types

Step 8: Mapping of Unary Relationship



# 1-DATA BASE FUNDAMENTALS

## 4-Normalization

- What is Normalization
- First Normal Form (1NF).
- Second Normal Form (2NF).
- Third Normal Form (3NF).





# 1-DATA BASE FUNDAMENTALS

## 5-MS SQL Sever DBMS

- Installation of MS SQL Server
- Installation Requirements
- SQL Server Versions History
- SQL Server Editions
- SQL Server Management Studio Tool





# 1-DATA BASE FUNDAMENTALS

## 6-Structured Query Language (SQL)

- What is SQL Language
- Installation Requirements
- Categories of T-SQL Statements
  - DML – Data Manipulation Language
  - DCL – Data Control Language
  - DDL – Data Definition Language
  - TCL - Transactional Control Language
  - DQL - Data Query Language (Select)
- SQL Data Types
  - Alphanumeric
  - Numeric
  - Date and Time



# 1-DATA BASE FUNDAMENTALS

## 7-Data Definition Language (DDL)

- Database Creation
- Database Deletion
- Create Table
- Alter Table
- Drop Table
- Database Constraints
  - Primary Key
  - Foreign Key
  - Not Null
  - Unique Key
  - Check





# 1-DATA BASE FUNDAMENTALS

## 8-Data Manipulation Language (DML)

- Insert
- Update
- Delete



# 1-DATA BASE FUNDAMENTALS

## 9-Data Query Language (DQL)

- Select Clause
- Filtering Data (Where)
- Sorting Data (Order By)
- Join
  - Inner join.
  - Left outer join.
  - Right outer join.
  - Full outer join.
  - Cross join.
- Union
- Union All
- INTERSECT
- EXCEPT





# 1-DATA BASE FUNDAMENTALS

## 9-Data Query Language (DQL)

- All
- Any
- Data Sampling.
  - TOP
  - DISTINCT
  - OFFSET
  - FETCH
- Aggregate functions
  - MAX()- MIN()- AVG()- SUM()- COUNT()
- Grouping (Group By)
- Having



# 1-DATA BASE FUNDAMENTALS

## 9-Data Query Language (DQL)

- T-SQL Operators.
  - Arithmetic operators.
  - Comparison operators.
  - Logical operators.
  - Other operators (IS- IN- BETWEEN- LIKE).





# 1-DATA BASE FUNDAMENTALS

## 10-Data Control Language Language (DCL)

- Grant
- Revoke



# 1-DATA BASE FUNDAMENTALS

## 1.1-Advanced SQL Server

- Variable
- If Condition
- While
- Function
  - Built-In
  - User-Defined
    - Scaler-Valued
    - Table-Valued
- Stored Procedures
  - Built-In
  - User-Defined
    - Parameter less
    - Input-Parameter





# 1-DATA BASE FUNDAMENTALS

## 11-Advanced SQL Server

- Trigger
  - AFTER.
  - INSTEAD OF
- View
- Index
  - Clustered
  - Non Clustered
- Truncate VS Delete
- Cursor
- Backup Restore



# 2-PROGRAMMING BASICS WITH C#

## 1-Introduction To Programming

- What is Programming and Why Learn Programming
- Program
- Machine Hardware [CPU-Memory-Input and Output Devices-Communication Devices]
- Mechanical Programming
- Operating System Software
- Platform [HW+OS]
- Machine Language
- Limitation and Complexity With Machine Language
- Assembly Language
- Complexity with Assembly Language





# 2-PROGRAMMING BASICS WITH C#

## 1-Introduction To Programming

- Programming Languages “High Level Language”
- Differences Between Programming Languages
- Language Syntax
- Standard Libraries
- Compilation Process
  - Compiled Language C,C++
  - Interpreted Language C#
- Programming Paradigm
  - Linear Paradigm
  - Procedure Paradigm
  - Object Oriented Paradigm



# 2-PROGRAMMING BASICS WITH C#

## 1-Introduction To Programming

- Compilation Time and it's Errors
- Execution Time and it's Errors
- Coding By Using a Text Editor
- Coding By Using IDE





# 2-PROGRAMMING BASICS WITH C#

## 2- .NET Framework Architecture

- What is .Net Framework
- History of .Net Framework
- MSIL “Cross Platform”
- .Net Languages “Cross Languages”
- .Net Framework Architecture
  - Common Language Run Time
  - Base Classes Library
  - Technology Components
- Common Language Run Time
  - JIT Compiler
  - Garbage Collector
  - Managed Code
- History of C# Language as one of .Net Languages



# 2-PROGRAMMING BASICS WITH C#

## 2- .NET Framework Architecture

- .NET Core Framework
- .NET Core Framework Versions
- .NET Framework VS .NET Core Framework





# 2-PROGRAMMING BASICS WITH C#

## 3- C# Basics

- Output Operation
  - Console.WriteLine
  - Console.Write
- Variables
- CTS
  - Primitive Data Type
  - Complex Data Type
- Value Type
  - Struct
  - Enum
- Reference Type
  - Class



# 2-PROGRAMMING BASICS WITH C#

## 3- C# Basics

- Implicit Casting
- Explicit Casting
- Const
- Readonly
- Comment
- Unary Operators.
  - Increment
  - Decrement
- Binary Operators
  - Arithmetic.
  - Relational
  - Logical
  - Bitwise.
  - Assignment





# 2-PROGRAMMING BASICS WITH C#

## 4- Selection Statement

- If Statement
- If – else Statement
- Switch Statement
- Ternary Operators



# 2-PROGRAMMING BASICS WITH C#

## 5- Iteration Statement

- Types of Iteration
  - Count Control Loop
  - Event Control Loop
- For Loop (Count Control Loop)
- While Loop (Event Control Loop)
- Do While Loop
- Continue
- Break





# 2-PROGRAMMING BASICS WITH C#

## 6-Reference Type

- String
- String Methods
- Array
- 2D Array
- Multi-Dimensional Array
- Jagged Array
- Array Methods



# 2-PROGRAMMING BASICS WITH C#

## 7-Method “Function”

- Why Method
- Method Return Type
- Method Parameter
- Method Calling
- Method Overloading
- Value Type Parameter
- Reference Type Parameter
- Pass by ref
- Pass out





# 2-PROGRAMMING BASICS WITH C#

## 8-User Defined Value Type

- Struct
- Enumeration
- Handling errors.
  - Try catch.
  - Customizing exception handling.
  - finally.



# 3-OBJECT ORIENTED PROGRAMMING WITH C#

## 1-Introduction To OOP

- What is OOP
- Benefits of OOP
- Class VS Object





# 3-OBJECT ORIENTED PROGRAMMING WITH C#

## 2-OOP Concepts

- Abstraction Concept
- Encapsulation Concept
- Access Modifiers
  - Public
  - Protected
  - Private
- Constructor
- Constructor Overloading



# 3-OBJECT ORIENTED PROGRAMMING WITH C#

## 2-OOP Concepts

- Relation Between Classes
  - Association
  - Aggregation
  - Composition
- Inheritance Concept
  - Virtual Method
  - Override Method
- Polymorphism Concept
- Abstract Class ,Abstract Method
- Interface





# 3-OBJECT ORIENTED PROGRAMMING WITH C#

## 2-OOP Concepts

- Static Property and Method
- Static Class
- Static Constructor
- Sealed Class
- Partial Class



# 4-ADVANCED PROGRAMMING WITH C#

## 1-Collections

- IEnumerable interface
- Foreach
- List
- ArrayList
- Dictionary





# 4-ADVANCED PROGRAMMING WITH C#

## 2-Advanced Topics

- Generic
- Nullable Type
- Delegate
  - Predicate
  - Func
  - Action
- Anonymous Method
- Lambda Expression
- Thread



# 4-ADVANCED PROGRAMMING WITH C#

## 2-Advanced Topics

- Implicit Typed Local Variable
- Anonymous Object
- Extension Method
- Sequence
- Eager Execution VS Deferred Execution
  - Yield Return





# 5-LANGUAGE INTEGRATED QUERY “LINQ”

## 1-Introduction To LINQ

- What and Why LINQ
- Data Filtration
- Data Selection



# 5-LANGUAGE INTEGRATED QUERY “LINQ”

## 2-LINQ Syntax

- Query Operators.
  - Select.
  - OrderBy- OrderByDescending.
  - ThenBy- OrderByDescending.
  - Where.
  - Contains.
  - All.
  - Any.
  - ElementAt- ElementAtOrDefault.
  - First- FirstOrDefault.
  - Last- LastOrDefault.
  - Single- SingleOrDefault.
  - Max.
  - Min





# 5-LANGUAGE INTEGRATED QUERY “LINQ”

## 2-LINQ Syntax

- Query Operators.
  - Average.
  - Sum.
  - Count
  - CountLong.
  - Take
  - TakeWhile.
  - Skip
  - SkipWhile.
  - GroupBy.
  - let.
  - into.



# 6-ENTITY FRAMEWORK “ORM”

1-Introduction To ORM

2-Database First Model

3-Code First Model

- DbContext
- Relationships
- Conventions and Mapping
- Configurations
- Data Annotation Attributes
- Fluent API
- Migration





# 7-ASP.NET CORE FUNDAMENTALS

## 1-Web App Generations

- Software Applications [Console-Desktop-Web-Mobile-Smart Tv...]
- PC VS Server
- Client VS Server
- First Web Generation Web 1.0
- Second Web Generation Web 2.0
- Third Web Generation Web 3.0
- Two Machine Communications



# 7-ASP.NET CORE FUNDAMENTALS

## 2-HTTP Protocol

- What is HTTP Protocol
- HTTP Request “Client”
- HTTP Response “Server”
- HTTP Request Message
  - Message Header
    - First Line
    - Header Content
  - Message Body
- HTTP Request Method “Verb”
- HTTP Response Message
  - Message Header
    - First Line “Status Code”
    - Header Content





# 7-ASP.NET CORE FUNDAMENTALS

## 3-ASP.NET Core Web Project

- **Project Structure**
  - Program.cs
  - Top Level Statement
  - Web Application Builder “Configurations and Services”
  - Run App as Web Application “Listen To Requests”
- **App Setting Json File**
  - Development Setting
  - Production Setting
  - Connection String
  - Reading App Setting in Program.cs with Web App Builder
- **Launch Setting Json File**
- **wwwroot “Static Files”**
- **Dependencies**
  - Assemblies
  - Frameworks



# 7-ASP.NET CORE FUNDAMENTALS

## 4-Middleware

- ASP.NET Framework Behavior
- ASP.NET Core Web App Pipeline
- What is Middleware
- Middleware Chain and it's Order
- Forward Middleware
- Terminate Middleware
- Custom Middleware Class
- Build-In Middleware
  - Authentication
  - Authorization
  - Static Files
  - Routing





# 7-ASP.NET CORE FUNDAMENTALS

## 5-Routing

- What is Routing
- Enable Routing in Asp.net Core Project
- URL Segments
- URL Segments Types
- Endpoint With Map,MapGet,MapPost



# 8-ASP.NET CORE MVC

## 1-Model-View-Controller Architecture Pattern

- What is Model
- What is View
  - Razor Engine
  - Cshtml File “Razor View” C#+HTML
- What is Controller
- MVC Configurations





# 8-ASP.NET CORE MVC

## 2-Controller

- Action Method
- Action Return Type
- IActionResult
  - ViewResult
  - ContentResult
  - FileResult
  - JsonResult
  - RedirectResult



# 8-ASP.NET CORE MVC

## 3-Model Binding

- Action Method Parameter
- HTTP Request Header
  - Query String
  - Route Data Parameter
- HTTP Request Body
  - XML/JSON
  - HTML Form (Form-data) “Key :Value”
    - X-www-form-urlencoded
    - Multipart/Form-data
- Default of Model Binder in MVC
- Model Binding Attributes
  - [FromQuery]
  - [FromRoute]
  - [FromBody]
  - [FromForm]





# 8-ASP.NET CORE MVC

## 4-View

- Razor Syntax
  - Conditional
  - Loops
- ViewData
- ViewBag
- ViewTemp
- Strongly Typed View “model”
- View Model
- Layout View
- ViewStart
- Tag Helpers
- Partial View
- Client-Side Libraries



# 8-ASP.NET CORE MVC

## 5-Model

- Validation
- Server-Side Validation
- Client-Side Validation
- Validation Attributes
- Model State
- Custom Validation





# 8-ASP.NET CORE MVC

## 6-CRUD Operations

- **Models**
  - Domain Classes
  - Validation
- **Controllers**
  - Get Action
  - 2 Add Action
  - 2 Edit Action
  - Delete Action
- **Views**
  - Get View
  - Add View
  - Edit View



# 8-ASP.NET CORE MVC

## 7-Search

- Filtering
- Pagination
- Sorting





# 8-ASP.NET CORE MVC

## 8-Files

- Upload Files
- Upload Images
- Sorting



# 8-ASP.NET CORE MVC

## 9-Security

- Authentication
- Authorization
- Microsoft Identity Package
- Register
- Login
- Send Email
- Forget Password





# 9-SOLID PRINCIPLES & DESIGN PATTERN

## 1-SOLID

- Principle VS Pattern
- Single Responsibilities
- Open/Close
- Liskov Substitution
- Interface Segregation
- Dependency Inversion
- Repository Pattern



# 10-IOC CONTAINER “DEPENDENCY INJECTION”

## 1-Controls

- What is Controls
- Inversion of Controls Principle
- Dependency Injection Pattern
- IOC Container
- Life Time Management
- Asp.net Core IOC Container “Services”
  - Add transient
  - Add scoped
  - Add Singleton





# 11-ASP.NET CORE WEB API

## 1-Intro To Web Services

- Multi App Versions [Desktop-Mobile-Web]
- Web Services [Share Functionalities]
- Machine Communications
- Function Call
- Data Transfer
- Description Services



# 11-ASP.NET CORE WEB API

## 2-Web Services Protocol

- Soap
- RestFull API
- HTTP Response Status Code
- JSON
- Postman





# 11-ASP.NET CORE WEB API

## 3-ASP.NET Core Web API

- Architecture of Model-Controller without View
- Routing Configurations
- Default Model Binding of Web API
- Crud Operations
- Test API with Postman
- Data Transfer Object “DTO”
- Enable CORS



# 12-CLEAN ARCHITECTURE WITH CQRS





# 13-SIGNALR “REAL LIVE TIME APP”



# 14-BLAZOR WEB ASSEMBLY “SINGLE PAGE”





# 15-INTERNET INFORMATION SERVER “IIS”

## 1-Deployment on Local Machine

- Real IP VS Virtual
- Port Number
- Windows Web Server “IIS”
- Host Web App on local Machine



# 15-VERSION CONTROL “GIT”

